In the Claims

1. (Currently amended) A method of real-time controlling exposure time in an x-ray apparatus, the apparatus comprising an x-ray source and a displaceable detector arranged to move with a controllable speed across an image exposure area, said detector having a first and a second edge, said first edge being adjacent to a movement direction of said detector, the method comprising the steps of:

[[i.]] a. setting a target signal, calculated to obtain a pre-defined signal to noise ratio (SNR),

[[ii.]] b. setting a detector Region Of Interest (ROI), comprising a sensor in said first edge,

[[iii.]] c. start scanning,

[[iv.]] d. collecting a signal from said ROI (404),

[[v.]] e. compensating the signal with respect to at least one of ROI size and efficiency,

[[vi.]] f. comparing the signal with a target signal (S_{target}) and calculating a new optimal velocity (406), and

[[vii.]] g. setting a new velocity during said scanning.

2. (Currently amended) The method of claim 1, wherein the target value is calculated from [[an]] a thickness of the object ~~thickness~~ to be inspected and spectrum incident on the object.

3. (Original) The method of claim 1, wherein the signal is acquired from a discrete number of regions on said detector.

4. (Original) The method of claim 1, wherein the detector is a photon-counting detector and the signal is the counted number of photons.

5. (Previously presented) The method of claim 1, wherein a distance the detector moves between readouts defines pixels in the scan direction as a first dimension, and in a second dimension, the detector comprises actual pixels.

6. (Previously presented) The method of claim 1, wherein the detector functions as a part of an exposure control system and an image receptor.

7. (Previously presented) The method of claim 1, wherein based on a number of photons collected in a predefined region of the detector, the scan velocity is alternated.

8. (Previously presented) The method of claim 7, further comprising changing scan-speed with respect to a count rate change in said region for controlling the number of counts reached per a first dimension pixel.

9. (Previously presented) The method of claim 7, comprising a feedback from said displaceable detector based on the count rate in said region.

10. (Previously presented) The method of claim 9, wherein said feedback is real-time and controls the scan speed of the detector.

11. (Previously presented) The method of claim 10, wherein the exposure of each point along an x-axis is controlled based on the count rate of said region and thus the entire image has a controllable signal level along the first dimension at least in said region in the second dimension.

12. (Previously presented) The method of claim 9, further comprising the step of minimizing total scan time by areas not covered by dense objects being scanned with increased speed and thus exposed shorter.

13. (Original) The method of claim 1, wherein said detector itself is used to control the exposure.

14. (Previously presented) The method of claim 15, wherein said step d comprises reading a number of counted photons or SNR.

15. (Previously presented) The method of claim 15, wherein said x-ray apparatus is a photon counting device and a new velocity (V_{new}) is calculated as $V_{new} = V_{old} \times S_{target} / S_{measured}$, wherein V_{old} is the old velocity, S_{target} is target signal and $S_{measured}$ is a measured signal.

16. (Previously presented) The method of claim 1, wherein in said step f, if target signal is higher than measured signal then the velocity is decreased otherwise old velocity is maintained.

17. (Previously presented) The method of claim 1, wherein said step f includes requiring new velocity to be at least higher than a pre-set minimum velocity.

18. (Previously presented) The method of claim 1, wherein depending on detector size the velocity decreases, if the target signal is higher than the measured signal otherwise the velocity is increased.

19. (Currently amended) The method of claim 1, comprising the alternative step [[(vi)]] f, said alternative step comprising [[of]]:

a. collecting a compression height ($h_{compression}$) data, projection and data about an examination type,

b. collecting from previous examinations, based on previous step, typical examination object density profile,

c. calculating an optimal velocity profile based on estimation of said density profile and measured signals, and

d. calculating new velocity based on data from steps a.- c.

20. (Previously presented) The method of claim 1, wherein said step of choosing the ROI includes:

(a) deciding an scan direction,

(b) choosing an ROI that will enter the object first, and

(c) checking that said ROI has a sufficient number of operative detector elements working else choosing next appropriate ROI.

21. (Previously presented) An arrangement for controlling exposure time mountable in an x-ray apparatus comprising an x-ray source and a displaceable detector arranged to be displaced with a controllable speed across an image exposure area, and said detector having a first edge arranged as leading edge in a displacement direction, said detector further comprising a Region Of Interest (ROI) comprising a sensor in said first edge, the arrangement comprising arrangement for setting a target signal, calculated to obtain a pre-defined signal to noise ratio (SNR), arrangement for obtaining a start velocity, arrangement for collecting a signal from said ROI, arrangement for compensating the signal with respect to at least one of ROI size and efficiency, comparing arrangement for comparing the signal with a target signal (S_{target}), arrangement for calculating a new optimal velocity, and an arrangement for setting a new velocity during said scanning.

22. (Previously presented) The arrangement of claim 21, wherein said arrangement for receiving detected signals is a processing unit and said arrangement (804) for controlling the detector replacement is a motor controller.

23. (Original) The arrangement of claim 21, wherein said displacement controller controls rotation of said detector having a rotation centre in said x-ray source.

24. (Currently amended) An X-ray apparatus of a photon counting type, said apparatus comprising an x-ray source and a displaceable detector being configured ~~arranged~~

to move with a controllable speed across an image exposure area, in a direction, said apparatus further comprising:

- ~~characterized by~~ an arrangement configured to count a ~~for counting the~~ number of photons detected by said displaceable [[the]] detector, ~~said detector comprising~~ which comprises an end portion arranged as a leading edge in said ~~the displacement~~ direction,
- a comparator arrangement ~~for comparing~~ configured to compare the counted number of photons from a sensor in said end portion under a scanning movement with a pre-set value, and
- a controller arrangement ~~for controlling the~~ configured to control said speed of the detector displacement with respect to a result obtained from a signal from said sensor, said signal corresponding to a density of an object to be examined under said scanning movement.

25. (Previously presented) A computer useable medium having a computer readable program code embodied therein to enable controlling exposure in an x-ray apparatus when imaging an object, the apparatus comprising an x-ray source, a displaceable detector, the computer program code being arranged to control displacement of said detector array with a controllable speed across an image exposure area, the computer program code comprising: an instruction set for acquiring a signal relating to photons incident on an edge portion of the detector in the scanning direction under a scanning movement, an instruction set for comparing said acquired signal with a target value, and instruction set for controlling the speed of detector displacement with respect to the result of the comparison under said scanning movement.

26. (Original) A computer useable medium having computer readable program code embodied therein to enable controlling exposure in an x-ray apparatus, for imagining an object, the apparatus comprising an x-ray source and a displaceable detector being arranged to move with a controllable speed across an image exposure area, said code comprising: a first instruction set for acquiring a signal relating to photons incident on at least a part of the

detector under a scanning movement, a second instruction set for comparing said acquired signal with a target value, and a third instruction set for controlling the speed of detector displacement with respect to the result of the comparison under said scanning movement.

27. (Cancelled)